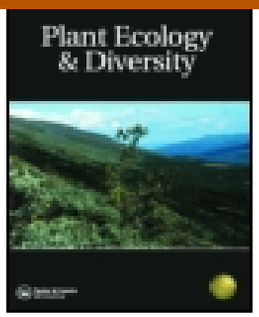

Transactions of the Botanical Society of Edinburgh

ISSN: 0374-6607 (Print) (Online) Journal homepage: http://www.tandfonline.com/loi/tped18

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William Gorrie

To cite this article: William Gorrie (1883) Notes on New Zealand Plants that withstood the severe Winter of 1878–89 at Rait Lodge, Trinity, near Edinburgh , Transactions of the Botanical Society of Edinburgh, 14:1-4, 52-64, DOI: 10.1080/03746608309468391

To link to this article: http://dx.doi.org/10.1080/03746608309468391

Notes on New Zealand Plants that withstood the severe Winter of 1878-79 *at Rait Lodge, Trinity, near Edinburgh.*

By William Gorrie of Rait Lodge.

(Read 8th January 1880).

Having long been strongly impressed with the notion that on the mountain ranges of New Zealand, and more particularly those of the middle and southern islands—New Munster and New Leinster—many hardy forms of the southern flora might be got that would impart new and highly important features to our forests, pleasure grounds, and gardens, I secured the good services of some friends who, from time to time within the last fifteen years, sent me such seeds from the provinces of Canterbury and Otago as they thought likely to interest me. From these seeds a few generally known hardy plants were reared, as well as the after-named less known kinds that, having withstood the rigours of the unusually severe and long protracted winter of 1878-79, may be looked upon as sufficiently hardy for our climate.*

1. Pittosporum tenuifolium (*Kohuhu* of the natives, and the fine-leaved Turpentine-tree of settlers).—"A bush or small tree, 20 to 40 feet high, with slender trunk." Timber, according to Captain J. Campbell Walker, "adapted for turnery purposes, and difficult of combustion." A plant 5 feet in height, on a south wall, withstood the last winter without injury, but several smaller ones of the same age suffered more or less in the open ground. Its beautiful, glaucous, smooth, undulated, evergeen leaves

* The minimums for the seven months of 1878-79 in which the temperature fell below the freezing-point were as follows :—First column from observations taken at Edinburgh by the Scottish Meteorological Society with thermometer protected from direct radiation by louvre boarding, in the usual manner; and second column from observations at the Edinburgh Botanic Garden, by a thermometer fully exposed to direct radiation :—

November 1878	26°·5	24°
December ,,	9°	9°
January 1879	16°·5	12°
February ,,	21°·4	19°
March ,,	17°	10°
April ,,	28°·7	26°
May ,,	29°·2	—

render this an important addition to our ornamental wall plants; and a closely allied species (*P. Colensoi*) has thriven for a number of years in the shrubbery of my neighbour, I. Anderson-Henry, Esq. of Woodend, at Hay Lodge, where they now measure from 6 feet to over 13 feet in height.

2. PLAGIANTHUS BETULINUS (Ribbon-tree of the settlers, and *Houi* of the Maori natives).—Described in Sir J. D. Hooker's "Handbook of the New Zealand Flora" as a lofty tree, attaining 40 to 70 feet in height, but that its wood is worthless; and by Captain J. Campbell Walker, Conservator of State Forests, in his Report of 1877, as "a graceful tree, 30 to 50 feet high, having white, compact, fissile, but not durable wood." Of several trees that I raised from seeds about ten years since, one that was planted in the open ground now measures fully 15 feet in height, and one on the south wall of my house is 23 feet. Both are of straight handsome growth, bearing considerable resemblance to our native weeping birch, especially in the size and form of their lower leaves, but those on the upper branches are three to four times larger. You will see by the branches before you that they are remarkably tough, so much so that they may be used like packing twine in tying; and I have found them very serviceable for fastening the branches of wall trees, not as is usually done with twisted willows, but by knot-tying. In fact, their toughness is so remarkable, that on the occasion of a Botanical Club visit in 1877, the members admitted that they had never seen such toughness in any unmanufactured vegetable substance. Having devoted considerable attention in endeavouring to discover a vegetable fibre capable of being profitably cultivated for paper making, I some years since felt satisfied that the tough fibrous twigs and wood of the ribbon-tree would be much more suitable for forming paper-pulp than the native poplar, fir, or other trees now in most demand for that purpose, and in this opinion I have been fully confirmed by that of eminent paper-makers and others well-qualified to judge. Neither of my plants have as yet flowered; and as their propagation is somewhat difficult as well as tedious, seeds will have to be procured in considerable quantity from the native habitats of the

ribbon-tree in order to ensure its early and extensive introduction to British forest culture. As to the forementioned worthless and non-durable character of its wood, it may be remarked that in young colonies the timber of unknown indigenous trees is generally judged of by its capability of withstanding the weather when employed for fencing and other out-of-door constructions, without regard to, or in ignorance of, its durability when kept dry; hence it may be presumed that the fissile or splitting properties and toughness of the ribbon-tree timber may recommend it for making riddle rims, basket handles, barrel hoops, and many other purposes. A keen angler, on testing some small twigs that I gave him, remarked that they would make excellent points for fishing-rods.

3. PLAGIANTHUS DIVARICATUS.—A small shrub, with many slender, spreading, tough branches. In all respects very different from, and much inferior to the last, but equally hardy, and would seemingly make good sweeping brooms and pot scrubbers. As it is only found in salt marches, where very few shrubby plants thrive, its cultivation in u ch places might be found beneficial.

4. ARISTOTELIA RACEMOSA (*Makomako* and *Mako* of the natives).—"A small, handsome tree, 6 to 20 feet high. Wood white, very light, makes veneers." Has grown for seven years on a south wall, where its branches have frequently been partly killed down, but were reproduced in the following season without any apparent diminution in vigour. The very elegant, largish, irregularly-formed deciduous leaves of this plant fully entitle it to a place on ornamental garden walls. Some plants which I gave to Lady Orde, four or five years since, have proved perfectly hardy in the mild west coast climate of Kilmory, Lochgilphead.

5. DISCARIA TOUMATOU (the "Wild Irishman" of settlers).—"A thorny bush in dry places, becoming a small tree in damper localities, with spreading branches, and branchlets reduced to spines 1 to 2 inches long, which were used in tatooing" (Hooker). This curious and very interesting plant has stood in the open ground with me perfectly unharmed for five or six years, as have also plants which I gave to Miss Hope of Wardie, and Charles Jenner, Esq., Easter Duddingstone Lodge. The seeds from which

these were raised were from the province of Canterbury; and one of my plants produced in the middle of last June a number of pretty small white flowers.

6. CORIARIA RUSCIFOLIA, and C. SARMENTOSA of botanists (the Toot poison-plant of settlers, and the *Tutu* or *Tua-tutu* of the natives).—The disastrous cattle-poisoning peculiarity of the toot have rendered it too well known to New Zealand agriculturists. Having cultivated a number of plants for some years, the seeds of which I had from the province of Canterbury, I found that at the base of a south wall they stood most winters unharmed, and had only the points of their shoots injured by frosts of unusual severity. In consequence of making some ground alterations at an unfavourable season for transplanting, I lost my toot plants three or four years since. Although they seemed to thrive well all the time I had them, they never assumed that tree-like form of growth which Sir. J. Hooker and other New Zealand botanists attribute to this species, but presented more of a sub-shrubby habit.

7. EDWARDSIA (SOPHORA) PULCHELLA, and E. GRANDIFLORA (the native Laburnums of settlers, and *Kowhai* of the Maoris).—These two, and the *E. microphylla*, grow to about the size of our European laburnums, and, like them, have dark-coloured heartwood, which is "valuable for fencing, veneers," &c. Although all very distinct, these three and another have been included under the generic name *E. tetraptera;* and the first, although easily distinguished by its slender, zigzag, flexuose branches, has been deemed identical with the straight-branched and more robust-growing *E. microphylla.* It has grown quite freely with me for the last twelve years on the south side of a 7 feet high wall, which it now overtops with its thickly-branched head; and its seeds have this peculiarity—that while many came up the first season that they were sown, others came up successively in each of the five following years. *E. grandiflora* was planted out in spring 1878, when about 2 feet in height; also on a south wall, and it stood the last winter perfectly uninjured.

8. CLIANTHUS PUNICEUS (the Glory Pea and Parrot-beak flower of the settlers, and *Kowhai ngutukaka* of the natives).—This being, according to Sir J. D. Hooker, a

native of only the Northern Island, or New Ulster, it has, since its introduction to Britain in 1832, been generally treated as a greenhouse plant, although in numerous instances it has survived mild winters on southerly exposed walls. A variety having much smoother leaves than the original, which was raised in England and named *C. p. magnificus*, is also much hardier than it, and has fully as beautiful racemes of 2 to 2½ inches long scarlet flowers. A well-spread plant of this variety on a south wall attained with me a height of about 14 feet, and had upwards of a thousand flowers all fully expanded at one time. Next winter, however, it was killed down to within 3 or 4 feet of the ground, and although two seedlings from it flowered and seeded in the open ground in summer 1877, they were both killed in the succeeding winter; but several residents at Bute and other west-coast watering places to whom I gave seeds were more successful with their products.

9. Rubus australis, *var.* cissoides.—The leaves of this variety have the peculiar appearance of being almost exclusively composed of rigid, prickly midribs. It and several other varieties form thick, rambling, very prickly, various-sized bushes, and are all about equally hardy, standing our severest frosts in moderately sheltered dry places. They are termed "Lawyers" by the settlers, and *Tataramoa* by the Maories.

10. Leptospermum scoparium (the Tea-tree and Brown Myrtle of Settlers, and *Manuka* of the natives).—A pretty white-flowered, large evergreen bush or small tree, the leaves of which are used as tea, and the twiggy branches for brooms. Among a number of three-year-old plants in the open ground several almost escaped injury, while others were more or less killed down. Like No. 4, it appears to be perfectly hardy in our west coast climate.

11. Fuchsia excorticata (*Kohutuputu* of the natives).—This once common inhabitant of our greenhouses, although never entirely killed, has its shoots so frequently cut down as to prevent it from flowering, and gives it a sub-herbaceous appearance.

12. Fuchsia procumbens.—This pretty little trailing plant, which within the last few years has become common

in our greenhouses and flower shows, has stood on a rockery for the last three years, and appears quite hardy.

13. ACIPHYLLA COLENSOI (the "Wild Spaniard" and "Spear-grass" of the settlers, *Kurikuri* and *Papaii* of the natives).—In Sir J. D. Hooker's "Handbook of the New Zealand Flora" this extraordinary evergreen herbaceous plant is described as forming a circular bush, 5 to 6 feet in diameter, of bayonet-like spines, impenetrable to men and horses, having 6 to 9 feet high flowering stems, covered with spreading spinous leaflets. "In another description its leaflets were stated to be as long, broad, and rigid as British bayonets, and a great deal sharper." Induced by these descriptions I procured a number of packets of "Wild Spaniard" seed in different years, but only one of those packets produced plants, and that after they had lain in the soil over one year. Although a real umbellifer, it has more an appearance of some of the dwarf palms; and an eminent botanist to whom I gave a plant, had it included among these in a list of his rarities which he afterwards sent me. The carrot-worms knew better, for on looking at my pot of seedlings one morning I found that they had destroyed more than the half of them. Planted on rockeries where fully exposed, several plants have stood uninjured for five or six years. The strongest of these flowered last summer, when it sent up a flower-stem nearly 4 feet in height; but owing, I suppose, to the very wet and cold weather, it damped or rotted off without perfecting seeds.

14. GRISELINIA LITTORALIS.—According to Capt. J. Campbell Walker, this in its native localities is a handsome tree 30 to 40 feet in height, the timber of which is hard, compact, and of great durability, valued for fencing-posts, sills, boat-knees, &c. A plant, now about six feet high, has stood in the open ground without injury for eight years. As an ornamental broad-leaved evergreen it is superior to the common bay laurel, and is decidedly hardier than either it, the *Laurustinus*, or the *Aucuba japonica*; hence its cultivation is being rapidly extended. Another species, *G. macrophylla*, has been repeatedly killed in the open air, even although having the protection of a south wall; but its much larger and very handsome foliage entitles it to a prominent place among plants for house and table decoration.

15. Corokia Cotoneaster (*Korokia* of the natives).—A low, spreading evergreen shrub, with thickly interlaced small tortuous branches. Two varieties of this curious and highly interesting plant, trained on a south wall—the one about 5 and the other fully 7 feet in height—were uninjured, and last spring both were thickly clothed with a profusion of small bright yellow flowers. In each of the last four seasons they have borne a few oblong bright red berries, which remained throughout the winter, and may be produced in much greater abundance as the bushes become older. Last winter some plants in the open ground were considerably injured, but these sent up numerous young shoots in summer.

16. Olearia Haastii (*Eurybia parvifolia*), Mr Julius Haast's arborescent Aster, or Daisy.—A dense growing small tree or large shrub, with rigid ovate leaves, averaging about an inch in length, of a dull somewhat glaucous green on their upper surface and whitish below. A young plant, about 18 inches in height, growing in an open border, was not the least injured. In Hooker's "Handbook of the New Zealand Flora," twenty arborescent and frutescent species of this genus are described, most of which are natives of the Middle Island, where several of them are found at such high altitudes as to ensure their being suitable for our climate; and apart from the peculiarities of their foliage, their daisy-like flowers would give a novel and interesting appearance to our shrubberies and woodlands. Like their near relation, that old greenhouse favourite the *Aster argophyllus*, or musk-tree, several of them are musk-scented. The timber of the larger growing kinds is hard, beautifully mottled or veined, and used for inlaying and veneering.

17. Veronica Traversii (W. T. Luke Travers' Speedwell).—A very pretty evergreen shrub, thickly clothed with small, light green, smooth, opposite leaves, which are regularly set in four rows along the branches. A plant about 18 inches high was perfectly uninjured, although several of the more generally known *V. decussata* of the Falkland Islands were completely killed in its vicinity. These last were from the Island of Rousay, where, as well as in others of the Orkney Isles, this species may be said to have become naturalised, coming up abundantly from

self-sown seed, and forming the best of shrubs for withstanding the violent sea winds of that comparatively mild climate.

18. VERONICA SALICIFOLIA, *var.* (the Willow-leaved Speedwell and *Koromiko* or *Korimuka* of the natives, also known as *V. Lindleyana*).—Of this somewhat variable old inhabitant of our gardens I had seeds from Canterbury, New Zealand, about ten years since, which produced plants that were of a more rigid bushy growth, as well as decidedly hardier than those I had growing previously. They were, however, a good deal injured by the unusual severity of last winter, but are readily reproduced from self-sown seed.

19. VERONICA PINGUIFOLIA.—This small dense growing glaucous-leaved shrub is remarkably pretty at all times, but more especially when covered with its profusion of white flowers. It proved perfectly hardy in differeut situations; and is particularly suitable for rockeries.

20. VERONICA HULKEANA.—A somewhat slender shrub of about 3 feet in height, with dark green ovate leaves, from 1 to 1½ inch in length, and handsome large branched spikes of pinkish-lilac flowers. I had no plant of this species in the open air last winter, but previous experience showed it incapable of withstanding our severest frosts without suffering more or less. Its very handsome flowers, however, entitle it to a little protection from very hard frosts; and they recommend it as a pot plant for winter forcing, or blooming in greenhouses during spring.

21. MUHLENBECKIA COMPLEXA (*Polygonum complexum* and *Coccoloba complexa*—interlaced, or complex branched Supple-Jack).—A tough slender climber, rambling over bushes and trees to considerable lengths; but comparatively dwarf and compact when grown without support. Planted on the west wall of a two-storey house, it reached the slates in six years, and two years later (in 1877), it covered a considerable portion of the wall with its thickly interlacing slender branches, and a profusion of small pretty light green leaves. In August and September of that year it produced an abundance of inconspicious green flowers, which, however, were not followed by the expected crop of its mistleto-like berries. Previous to last winter it never

sustained the least injury from frost, but then many of the branches were so much affected that they had to be shortened or cut out. Of this very interesting plant I have cultivated two varieties, the one having entire leaves, while those of the other are deeply indented or contracted in their middle.

22. LIBERTIA GRANDIFLORA MAJOR.—A very handsome herbaceous evergreen, with stout grassy-like leaves, from 20 to 30 inches in length by a third to half an inch in width; and having spike-like panicles about 3 feet high or pure white showy flowers, that are produced in succession from a month to six weeks. This variety, which I have grown about twelve years, has larger flowers and more compact panicles than that previously in cultivation. Till last winter it grew freely, flowering and seeding abundantly; but the plants then suffered less or more from the excessive frost, although none were entirely killed, and some even flowered and seeded last summer as profusely as before. The bulky produce of tough leaves which this *Libertia* yields claim for it the attention of paper-makers; and as an ornamental plant for flower borders, shrubberies, or moderately open woodlands, the abundance and pure whiteness of its flowers render it particularly attractive, while if once introduced where its self-sown young plants are allowed to grow up, it will maintain a conspicuous existence even among our stronger growing wild flowers.

23. LIBERTIA IXIOIDES.—A pretty white-flowered evergreen herbaceous plant, with more branched inflorescences than the last, and only about a third of its size. Well adapted for growing on rockeries, and perfectly hardy.

24. CORDYLINE AUSTRALIS (Cabbage-tree or Grass-tree of the settlers, and *Houka* or *Ti* of the Maoris).—In hopes of acquiring hardier forms of this well-known elegant palm-like tree than those usually cultivated in our greenhouses, I, through the kind assistance of Mr James Melvin of Bonnington, Ratho, obtained seeds from its colder habitats in Otago, the plants raised from which grew for six or seven years, sustaining a minimum temperature of 20° without any artificial protection, by which time they attained a height of 3 to 4 feet; but a severe winter then killed them to the ground, with the exception of one, which

stood unharmed till last winter, when it also succumbed. The late Dr Moore of Dublin, who saw this plant in April 1876, told me it was now recognised as a new species, named *C. calicoma*, and distinguished from *C. australis* by having flat instead of incurved leaves. The graceful growth and wind-withstanding properties of this cabbage-tree and its varieties recommend them as portable summer decorative plants for growing in vases or large flower-pots, and they may be wintered in any glass-roofed structure without artificial heat.

25. CHRYSOBACTRON HOOKERI (*Anthericum Hookeri*).—A showy deciduous herbaceous plant, 1½ to 2 feet in height, with bright yellow flowers, having much the appearance of our pretty bog asphodel (*Narthecium ossifragum*), but larger in all its parts. Is quite hardy.

26. PHORMIUM TENAX (the New Zealand Flax or Flax Lily: *Harareke, Harakeke, Korari* and *Coradi* of the Maoris).—The highly interesting paper which was read at our last meeting from Dr. Wm. Traill on the growth of *P. tenax* in Orkney, where it flowered and perfected seeds last year, showed its greater suitability for that northern climate than for the occasional severer winters that we experience in the Lothians. A minimum temperature of 15° seems about the lowest that it will stand without injury, so that the last winter minimum of 9° injured the tops of the leaves, and disfigured the plants considerably. Of late years several variegated leaved varieties of the *P. tenax* have been special objects of attraction in our greenhouses and flower shows, but they have generally been deemed too tender for outdoor cultivation; two of these, however, stood the last winter on my rockery fully as well as the ordinary green sorts, and all sent up fine young leaves in the course of the summer. All the varieties, when grown in large vases or flower-pots for outdoor decoration in summer, contrast effectively with the surrounding shrubs and flowers; and, like the *Cordyline australis*, may be wintered in glass-roofed structures without artificial heat.

27. CAREX SECTA or CAREX VIRGATA, β secta (the Grass-tree of settlers).—Is so called from its forming large tufts of roots from 1 to 6 feet in height, and 6 to 18 inches in

diameter, somewhat resembling the stems of tree ferns. Three-year-old plants have stood uninjured, without as yet showing any appearance of forming tufts or stems.

28. ARUNDO CONSPICUA (New Zealand Reed, *Tohi-Tohi* or *Toe-Toe* of the natives).—This tallest of New Zealand grasses frequently exceeds 10 feet in height; and bears a considerable resemblance to the now generally known pampas-grass of South America (*Gynerium argenteum*), but its elegant feathery white panicles are produced in July instead of October, as are those of the latter, compared with which it is decidedly more tender, and was so much injured last winter that my old plant had to be lifted, and those portions that were alive replanted.

29. ASPIDIUM RICHARDI (*Polystichum aristatum*).—Height 6 to 10 inches. This fern has stood in my rockery without protection for the last fourteen years, and its remarkably dark green, rigid shining fronds, entitle it to much more general cultivation than it has yet received.

30. TODEA SUPERBA (*Leptopteris superba*, the superb New Zealand Filmy Fern).—This most elegant of ferns has grown well with me for the last six years in a cool frame at the north back of a garden wall, having only a thin covering of tiffany under the glass to ensure for it the deep shade of its native forest habitats. When the plant came into my possession its fronds were only about 9 inches long, but now several of them are more than twice that length. On lifting the frame-sash where it was growing during the hardest frosts of the present and last winter, I found the soil about it a solid frozen mass, while its densely crowded minute pinnæ, which retain the condensed moisture, were separately enveloped in a white icy covering, so that the fronds far surpassed the finest ostrich feathers in elegance.

In concluding these remarks on the few New Zealand plants which have been objects of cultural experiment with me, I may state that their number is much too limited, and the indigenous habitats of most of them are at too low altitudes to convey any idea of the variety and extent of the botanical treasures suitable for our climate which still await introduction from the snow-capped Canterbury and Southern Alps, as well from other elevated mountain ranges, of which may be mentioned the following from among

other trees and shrubs described in Sir J. D. Hooker's "Handbook of the New Zealand Flora:"—At least ten Leguminosæ, six Saxifrageæ, four Myrtaceæ, eight Araliaceæ, twelve Rubiaceæ, thirty Compositæ, twenty Ericeæ, five Cupuliferæ (evergreen Beeches), and ten Coniferæ. One palm, the *Areca sapida*, found on the higher parts of Banks' Peninsula, and above the lower glaciers on Mount Cook. Herbaceous plants in immense variety and many of them of great beauty; while for the quantity and elegance of its ferns, New Zealand is not surpassed by any country of like extent in the world.

In 1850 Mr John Jeffrey, and in 1863 Dr Robert Brown, were sent to North-West America as botanical collectors by an association which originated in Edinburgh. Could not such an association be now organised for sending an efficient botanical collector to New Zealand? And if so, it would be well to secure the co-operation of proprietors on the western and northern coasts and islands of Britain, where the mildness of the winters would be most conducive to the success of the introduced plants, and where they might be extensively reared and grown on private estates; or by public enterprise, as in botanical gardens having judiciously selected sites, for of all botanic gardens now in Britain, only one of any importance, viz., that of Liverpool, is situated within the influence of the west coast climate, and even compared with it many much more favourable situations could be got along the western coasts of Scotland. As showing that this notion of introducing the hardier plants of New Zealand has been one of some standing with me, I may mention that, at a meeting held in 1863 to consider the best place for sending Dr Robert Brown to as a collector, on the question being put to me by George Patton, Esq. of The Cairnies—afterwards the Lord Justice-Clerk—I unhesitatingly replied, "To the great western mountain range of the Middle Island of New Zealand;" which was met by the objection "That place has never been thought of; and besides it cannot be got at, as there is no shipping or trade connected with it." The finding of gold has since, however, brought both shipping and trade to it; and yet its native flora is almost as little known to British cultivators as ever.

In addition to the scientific names of New Zealand plants in the preceding list, those applied by the settlers and natives are also given, so far as they are known, as by such names collectors can get any kinds of seeds they may be in want of, with more ease and certainty than by using the botanical names only.

On the British-American Species of the Genus Viola. By Professor George Lawson, Dalhousie College, Halifax.

(Read 11th March 1880).

In this paper the author states that his object is to interest botanists in the study of a lowly but beautiful family of plants whose headquarters are in the temperate regions of America, but whose relations to each other as species, varieties, or hybrids, are as yet imperfectly known.

He has some of the related species in cultivation for the purpose of studying the remarkable variations in form, texture, and size of organs, of the same individual plants at different periods of the year, and he hopes that other botanists and cultivators may be induced to undertake a careful study of the living plants in the same way, which seems to hold out the only hope of arriving at satisfactory conclusions.

The number of British-American species, not counting varieties, is twenty. Of these, eight grow within the limits of the Nova Scotia peninsula, and four others are not unlikely, sooner or later, to be added.

The species are divided into four groups:—(1) those with long and thick fleshy rhizomes, sending up annually radical leaves and flowers from terminal buds; (2) those with rhizomes sending up annually long-stalked radical leaves and leafy flower-shoots; (3) those with slender and woody roots and stems branching into annual leafy flower-shoots; (4) those that have permanent and leafy stems and leafy stipules.

The distinctive characters of each species and of its varieties are pointed out, and also the geographical and local distribution of the various forms, which in many cases has been incorrectly indicated in published works.